CLAIMS

WHAT IS CLAIMED IS:

1. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

selectively removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

2. The method of claim 1, wherein the substrate comprises borosilicate glass or fused silica.

3. The method of claim 1, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

4. The method of claim 1, wherein the exposed chrome is removed by a dry etch.

5. The method of claim 1, wherein the exposed chrome is removed by a wet etch.

6. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the

edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: means to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery; means to apply and remove the solvent from the edge of the workpiece; and means to apply and remove the solvent from the bottom surface of the workpiece adjacent to the periphery, wherein each means to apply and remove a solvent may be independently controlled;

selectively applying and removing solvent by means of the nozzle tool to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

7. The method of claim 6, wherein the substrate comprises borosilicate glass or fused silica.

8. The method of claim 6, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

9. The method of claim 6, wherein the exposed chrome is removed by a dry etch.

10. The method of claim 6, wherein the exposed chrome is removed by a wet etch.

11. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: a first nozzle adapted to apply a solvent to the top surface of the workpiece adjacent to the periphery; a second nozzle adapted to apply a solvent to the edge of the workpiece; a third nozzle adapted to apply a solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first, second and third nozzles to selectively apply solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

12. The method of claim 11, wherein the substrate comprises borosilicate glass or fused silica.

13. The method of claim 11, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

14. The method of claim 11, wherein the exposed chrome is removed by a dry etch.

15. The method of claim 11, wherein the exposed chrome is removed by a wet etch.

16. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: a first nozzle and vacuum means adapted to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery; a second nozzle and vacuum means adapted to apply and remove a solvent to the edge of the workpiece; a third nozzle and vacuum means adapted to apply and remove a solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first nozzle and vacuum means, the second nozzle and vacuum means and the third nozzle and vacuum means to selectively apply and remove solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

17. The method of claim 16, wherein the substrate comprises borosilicate glass or fused silica.

18. The method of claim 16, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

19. The method of claim 16, wherein the exposed chrome is removed by a dry etch.

20. The method of claim 16, wherein the exposed chrome is removed by a wet etch.

21. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

selectively removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

22. The method of claim 21, wherein the substrate comprises borosilicate glass or fused silica.

23. The method of claim 21, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

24. The method of claim 21, wherein the exposed chrome is removed by a dry etch.

25. The method of claim 21, wherein the exposed chrome is removed by a wet etch.

26. The method of claim 21, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

27. The method of claim 21, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

28. The method of claim 27, wherein the e-beam is grounded to the exposed chrome layer.

29. The method of claim 28, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

30. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: means to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery; means to apply and remove the solvent from the edge of the workpiece; and means to apply and remove the solvent from the bottom surface of the workpiece adjacent to the periphery, wherein each means to apply and remove a solvent may be independently controlled;

selectively applying and removing solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

31. The method of claim 30, wherein the substrate comprises borosilicate glass or fused silica.

32. The method of claim 30, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

33. The method of claim 30, wherein the exposed chrome is removed by a dry etch.

34. The method of claim 30, wherein the exposed chrome is removed by a wet etch.

35. The method of claim 30, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

36. The method of claim 30, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

37. The method of claim 35, wherein the e-beam is grounded to the exposed chrome layer.

38. The method of claim 36, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

39. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: a first nozzle adapted to apply a solvent to the top surface of the workpiece adjacent to the periphery; a second nozzle adapted to apply a solvent to the edge of the workpiece; a third nozzle adapted to apply a solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first, second and third nozzles to selectively apply solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

40. The method of claim 39, wherein the substrate comprises borosilicate glass or fused silica.

41. The method of claim 39, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

42. The method of claim 39, wherein the exposed chrome is removed by a dry etch.

43. The method of claim 39, wherein the exposed chrome is removed by a wet etch.

44. The method of claim 39, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

45. The method of claim 39, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

46. The method of claim 44, wherein the e-beam is grounded to the exposed chrome layer.

47. The method of claim 46, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

48. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: a first nozzle and vacuum means adapted to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery; a second nozzle and vacuum means adapted to apply and remove a solvent to the edge of the workpiece; a third nozzle and vacuum means adapted to apply and remove a solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first nozzle and vacuum means, the second nozzle and vacuum means and the third nozzle and vacuum means to selectively apply and remove solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

49. The method of claim 48, wherein the substrate comprises borosilicate glass or fused silica.

50. The method of claim 48, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

51. The method of claim 48, wherein the exposed chrome is removed by a dry etch.

52. The method of claim 48, wherein the exposed chrome is removed by a wet etch.

53. The method of claim 48, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

54. The method of claim 48, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

55. The method of claim 53, wherein the e-beam is grounded to the exposed chrome layer.

56. The method of claim 55, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

57. A nozzle tool for removing a material from a workpiece having a top surface and bottom surface and an edge, defining a periphery, connecting the top and bottom surfaces, the tool comprising:

first means to apply and remove a solvent for the material, the first means being adapted to apply and remove the solvent to the top surface of the workpiece adjacent to the periphery;

second means to apply and remove the solvent, the second means being adapted to apply and remove the solvent to the edge of the workpiece; and

third means to apply and remove the solvent, the third means being adapted to apply and remove the solvent to the bottom surface of the workpiece adjacent to the periphery,

wherein each means to apply and remove the solvent may be independently controlled.

58. A nozzle tool for removing a material from a workpiece having a top surface and bottom surface and an edge, defining a periphery, connecting the top and bottom surfaces, the tool comprising:

a first nozzle and vacuum means adapted to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery;

a second nozzle and vacuum means adapted to apply and remove a solvent to the edge of the workpiece;

a third nozzle and vacuum means adapted to apply and remove a solvent to the bottom surface of the workpiece adjacent to the periphery,

wherein each nozzle may be independently controlled.

59. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

applying and removing a solvent selectively to the top surface, bottom surface and edge to dissolve the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

60. The method of claim 59, wherein the substrate comprises borosilicate glass or fused silica.

61. The method of claim 59, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

62. The method of claim 59, wherein the exposed chrome is removed by a dry etch.

63. The method of claim 59, wherein the exposed chrome is removed by a wet etch.

64. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

applying and removing a solvent selectively to the top surface, bottom surface and edge to dissolve the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present;

selectively removing photoresist material adjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

65. The method of claim 64, wherein the substrate comprises borosilicate glass or fused silica.

66. The method of claim 64, wherein the chrome comprises at least one of the group consisting of chromium; chromium oxide, and a chromium/nitrogen/oxygen containing compound.

67. The method of claim 64, wherein the exposed chrome is removed by a dry etch.

68. The method of claim 64, wherein the exposed chrome is removed by a wet etch.

69. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: means to apply a solvent to the top surface of the workpiece adjacent to the periphery; means to remove the solvent from the edge of the workpiece; and means to apply the solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each means to apply and remove a solvent may be independently controlled;

selectively applying and removing solvent by means of the nozzle tool to the top surface and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

70. The method of claim 69, wherein the substrate comprises borosilicate glass or fused silica.

71. The method of claim 69, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

72. The method of claim 69, wherein the exposed chrome is removed by a dry etch.

73. The method of claim 69, wherein the exposed chrome is removed by a wet etch.

74. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: a first nozzle adapted to apply a solvent to the top surface of the workpiece adjacent to the periphery; and a second nozzle adapted to apply a solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first and second nozzles to selectively apply solvent to the top surface and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

75. The method of claim 74, wherein the substrate comprises borosilicate glass or fused silica.

76. The method of claim 74, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

77. The method of claim 74, wherein the exposed chrome is removed by a dry etch.

78. The method of claim 74, wherein the exposed chrome is removed by a wet etch.

79. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: a first nozzle adapted to apply a solvent to the top surface of the workpiece adjacent to the periphery; a second nozzle adapted to apply a solvent to the bottom surface of the workpiece adjacent to the periphery; a vacuum means adapted to remove a solvent from the edge of the workpiece, wherein each nozzle may be independently controlled;

controlling the first nozzle, the second nozzle and the vacuum means to selectively apply and remove solvent to the top surface and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing at least one tab if more than one tab is present; and

removing the exposed chrome layer.

80. The method of claim 79, wherein the substrate comprises borosilicate glass or fused silica.

81. The method of claim 79, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

82. The method of claim 79, wherein the exposed chrome is removed by a dry etch.

83. The method of claim 79, wherein the exposed chrome is removed by a wet etch.

84. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising: means to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery; means to apply and remove the solvent from the edge of the workpiece; and means to apply and remove the solvent from the bottom surface of the workpiece adjacent to the periphery, wherein each means to apply and remove a solvent may be independently controlled;

selectively applying and removing solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

85. The method of claim 84, wherein the substrate comprises borosilicate glass or fused silica.

86. The method of claim 84, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

87. The method of claim 84, wherein the exposed chrome is removed by a dry etch.

88. The method of claim 84, wherein the exposed chrome is removed by a wet etch.

89. The method of claim 84, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

90. The method of claim 84, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

91. The method of claim 89, wherein the e-beam is grounded to the exposed chrome layer.

92. The method of claim 90, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

93. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising a first nozzle adapted to apply a solvent to the top surface of the workpiece adjacent to the periphery; a second nozzle adapted to remove the solvent from the edge of the workpiece; a third nozzle adapted to apply the solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first, second and third nozzles to selectively apply and remove solvent to the top surface, edge and bottom surface of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

94. The method of claim 93, wherein the substrate comprises borosilicate glass or fused silica.

95. The method of claim 93, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

96. The method of claim 93, wherein the exposed chrome is removed by a dry etch.

97. The method of claim 93, wherein the exposed chrome is removed by a wet etch.

98. The method of claim 93, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

99. The method of claim 93, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

100. The method of claim 98, wherein the e-beam is grounded to the exposed chrome layer.

101. The method of claim 100, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

102. A method for making a photomask, the method comprising the steps of:

providing a workpiece comprising a substrate having a top surface, a bottom surface opposed to the top surface and an edge connecting the top surface and the bottom surface, the

edge defining a periphery of the substrate, wherein a layer of chrome superimposes the top surface and a layer of a photoresist material superimposes the chrome layer;

providing a nozzle tool comprising a first nozzle adapted to apply and remove a solvent to the top surface of the workpiece adjacent to the periphery; a vacuum means adapted to remove a solvent from the edge of the workpiece; a second nozzle and vacuum means adapted to apply a solvent to the bottom surface of the workpiece adjacent to the periphery, wherein each nozzle may be independently controlled;

controlling the first nozzle, the second nozzle and the vacuum means to selectively apply and remove solvent to the top surface and bottom surface of the workpiece and remove solvent from the edge of the workpiece thereby removing the photoresist material from portions of the workpiece adjacent to the periphery to expose the chrome layer while leaving at least one tab of photoresist material covering the chrome layer adjacent to the periphery;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a first pattern;

removing the exposed chrome layer;

removing the tab of photoresist material, or removing one tab if more than one tab is present;

selectively removing photoresist material nonadjacent to the periphery to expose the chrome layer in a second pattern; and

removing the exposed chrome layer.

103. The method of claim 102, wherein the substrate comprises borosilicate glass or fused silica.

104. The method of claim 102, wherein the chrome comprises at least one of the group consisting of chromium, chromium oxide, and a chromium/nitrogen/oxygen containing compound.

105. The method of claim 102, wherein the exposed chrome is removed by a dry etch.

106. The method of claim 102, wherein the exposed chrome is removed by a wet etch.

107. The method of claim 102, wherein the first pattern is formed by writing the pattern into the photoresist with an e-beam.

108. The method of claim 102, wherein the second pattern is formed by writing the pattern into the photoresist with an e-beam.

109. The method of claim 107, wherein the e-beam is grounded to the exposed chrome layer.

110. The method of claim 109, wherein the e-beam is grounded to the chrome layer exposed by removal of the tab.

111. A nozzle tool for removing a material from a workpiece having a top surface and bottom surface and an edge, defining a periphery, connecting the top and bottom surfaces, the tool comprising:

first means to apply a solvent for the material, the first means being adapted to apply the solvent to the top surface of the workpiece adjacent to the periphery;

second means to apply the solvent, the second means being adapted to apply the solvent to the bottom surface of the workpiece; and

means to remove the solvent, the removal means being adapted to remove the solvent from the edge of the workpiece adjacent to the periphery,

wherein each means to apply and remove the solvent may be independently controlled.

112. A nozzle tool for removing a material from a workpiece having a top surface and bottom surface and an edge, defining a periphery, connecting the top and bottom surfaces, the tool comprising:

a first nozzle adapted to apply a solvent to the top surface of the workpiece adjacent to the periphery;

a vacuum means adapted to and remove a solvent to the edge of the workpiece;

a second nozzle adapted to apply a solvent to the bottom surface of the workpiece adjacent to the periphery,

wherein each nozzle may be independently controlled.